

WHAT IS CLAIMED IS:

1. A method of producing polyisocyanates of the diphenylmethane series comprising:
  - a) reacting aniline and formaldehyde in the presence of HCl to provide a product mixture containing polyamines of the diphenylmethane series, HCl, aniline and water;
  - b) removing excess aniline and water by distillation to provide a product mixture comprising polyamines of the diphenylmethane series, HCl, no more than 10 wt.% aniline based on the polyamines, and no more than 5 wt.% water based on the polyamines; and
  - c) phosgenating the product mixture in (b).
2. The method according to Claim 1, wherein the distillation is performed in the presence of an entrainer.
3. The method according to Claim 1, wherein the distillation is performed by a method comprising removing aniline by distillation in the presence of water as entrainer; and removing water by distillation.
4. The method according to Claim 1, wherein, the product mixture in (b) comprises no more than 2 wt.% aniline based on the polyamines, and no more than 1 wt.% water with based on the polyamines.
5. The method according to Claim 2, wherein, the product mixture in (b) comprises no more than 2 wt.% aniline based on the polyamines, and no more than 1 wt.% water with based on the polyamines.

6. The method according to Claim 3, wherein, the product mixture in (b) comprises no more than 2 wt.% aniline based on the polyamines, and no more than 1 wt.% water with based on the polyamines.
- 5 7. The method according to Claim 1, wherein the product mixture in (b) comprises no more than 0.2 wt.% aniline based on the polyamines, and no more than 0.1 wt.% water based on the polyamines.
- 10 8. The method according to Claim 2, wherein the product mixture in (b) comprises no more than 0.2 wt.% aniline based on the polyamines, and no more than 0.1 wt.% water based on the polyamines.
- 15 9. The method according to Claim 3, wherein the product mixture in (b) comprises no more than 0.2 wt.% aniline based on the polyamines, and no more than 0.1 wt.% water based on the polyamines.